

Exploration classifier details

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 An abbreviated version of this protocol was published in eLIFE

BehaviorDEPOT is a simple, flexible tool for automated behavioral detection based on markerless pose tracking

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Detailed protocol

The Object Exploration classifier identifies frames in which the animal is "exploring" an ROI, with exploration parameterized as frames in which the head is near the object and oriented toward the object, without being within the object boundaries.

All that's required is an overhead recording and point tracking of the nose, ears, and tailbase. The classifier works by first setting three behavior thresholds: minimum exploration duration (minDuration (s)); external perimeter around the object to include (objDistThresh (cm)); and an internal perimeter within the object to exclude certain non-exploration behaviors (eg climbing on or sitting atop the object) (noseDist (cm)). These parameters can be adjusted by checking the 'Edit' box on the main BehaviorDEPOT window. By default, the values are 0.25 seconds minimum exploration bout, 2 cm external perimeter, and 2 cm internal perimeter. The object boundaries are manually drawn by the user. To draw an ROI, enter 1 in the "# ROIs" field of the app. Exploration of only one object at a time is quantified, so if you want to analyze exploration for multiple objects, run it on one object, move/rename the output folder to prevent overwriting, then run it again for the second object.

The classifier works by identifying when the nose is within the external perimeter and when the head is oriented toward the object (extending a line from between the ears, to the nose and out), and then excluding periods when the head and/or tailbase are within the internal perimeter. The exclusion criteria are to remove climbing or sitting atop the object, which we don't count as exploration.

Please reach out to us (email or GitHub page) for any additional help. Instructions for general BehaviorDEPOT setup and use are found on the [GitHub page](#).

How to cite: (Readers should cite both the Bio-protocol preprint and the original research article where this protocol was used)

1. Zeidler, Z. and A DeNardo, L. (2022). Exploration classifier details. Bio-protocol Preprint. bio-protocol.org/prep1951.
2. BehaviorDEPOT is a simple, flexible tool for automated behavioral detection based on markerless pose tracking. eLIFE. DOI: [10.7554/eLife.74314](https://doi.org/10.7554/eLife.74314)

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